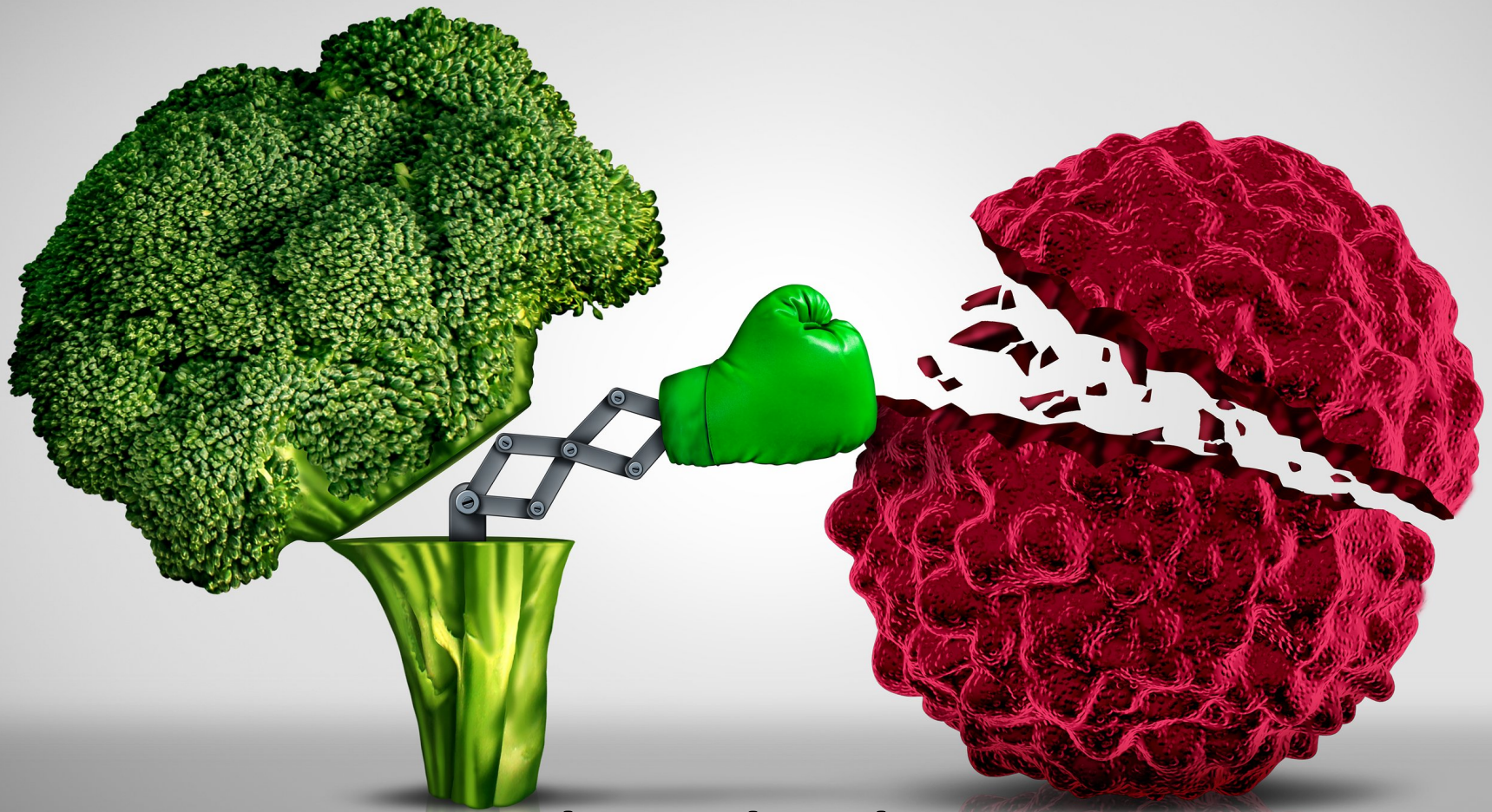
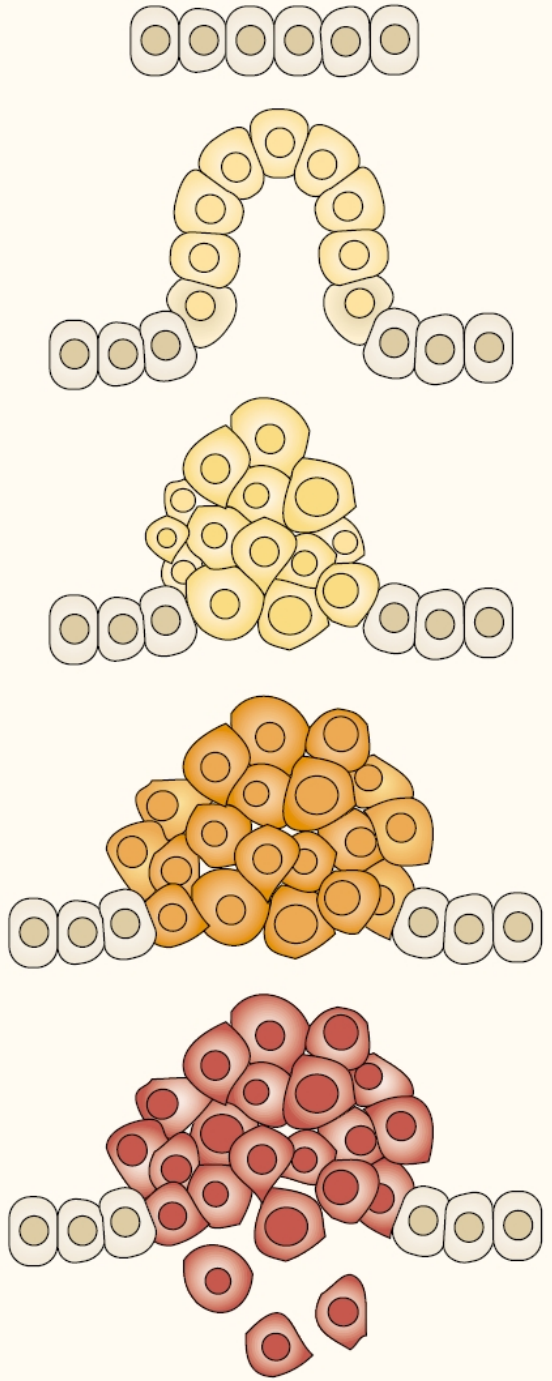
Reversing Cancer



Mark Sandoval, M.D.

Cancer

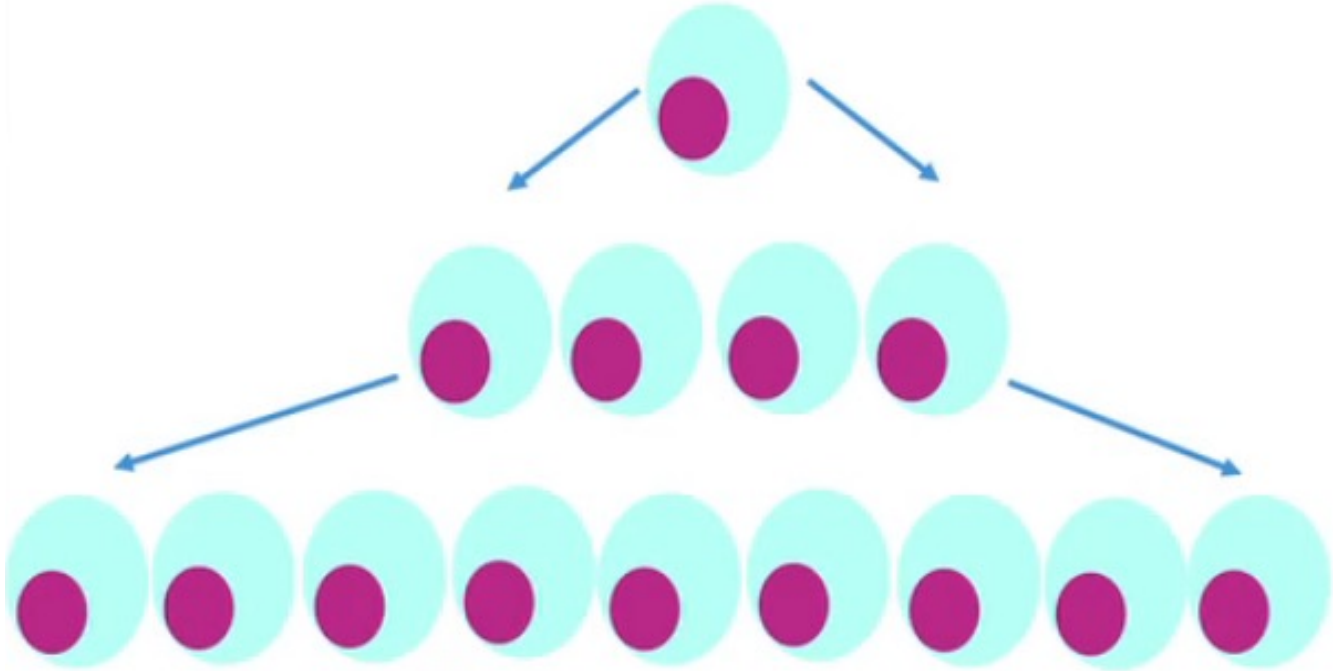
- Cancer = a collection of related diseases
- Some body cells begin to divide without stopping & spread into surrounding tissues

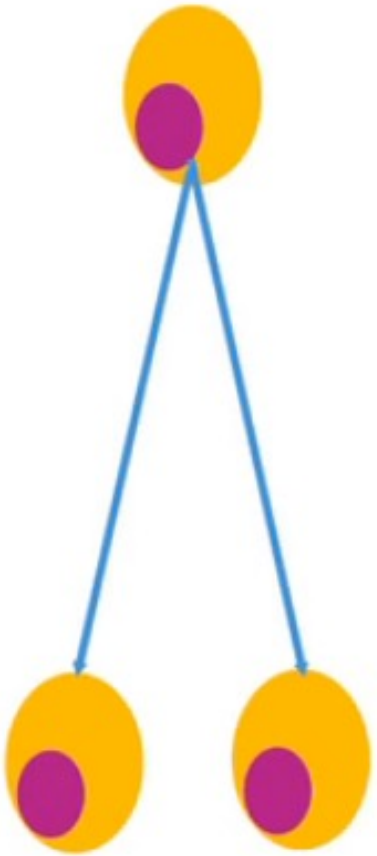


Cancer Characteristics

- Cancer can start anywhere in the body
- Normally cells grow & divide or die when needed
- In cancer, this order breaks down
- Cells survive when they should die
- New cells form when not needed
- Cells divide without stopping

Dysregulated growth regulation of cancer cells



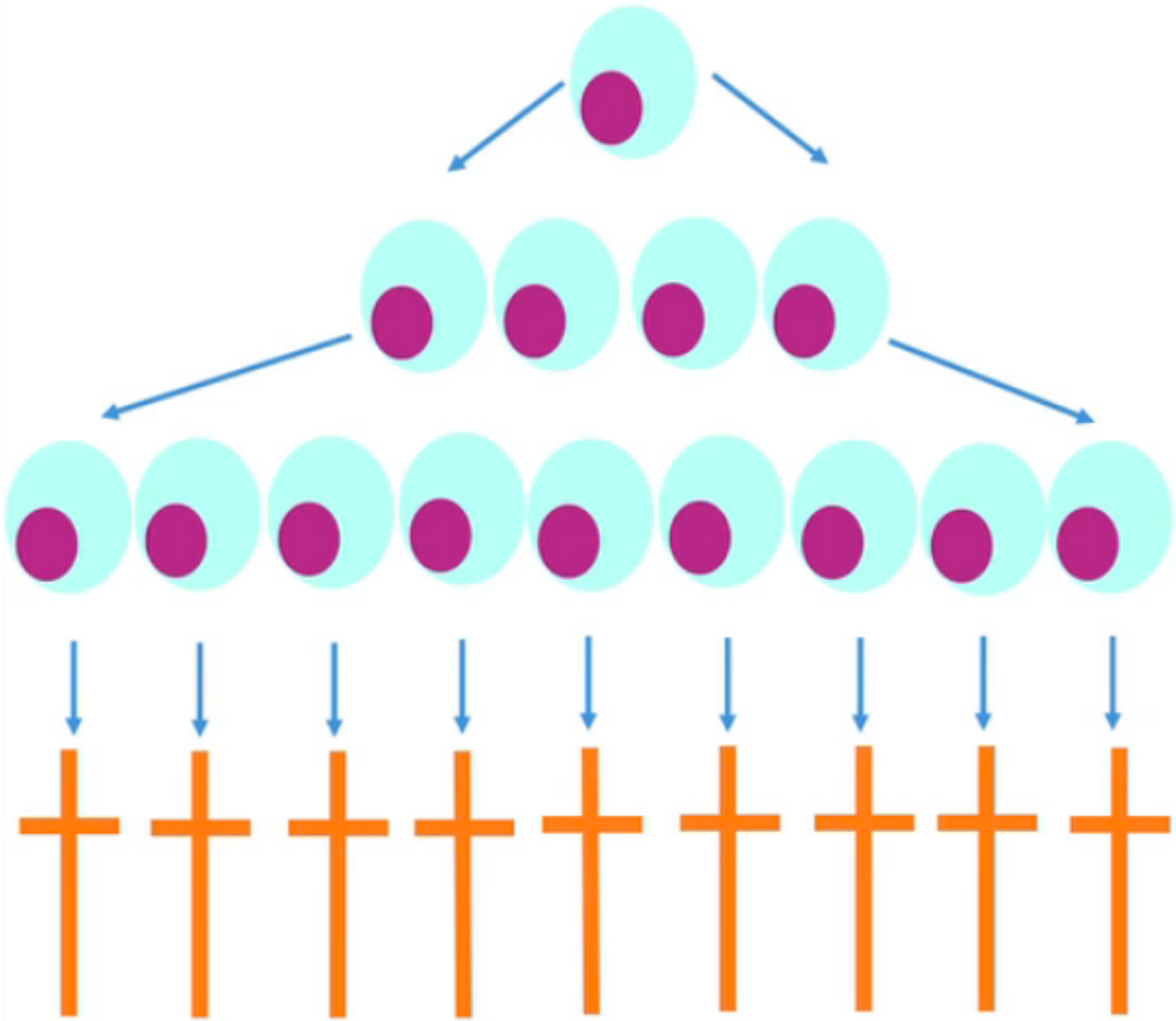


1 human myeloid progenitor cell generates approx 10,000 daughter cells in 7 days

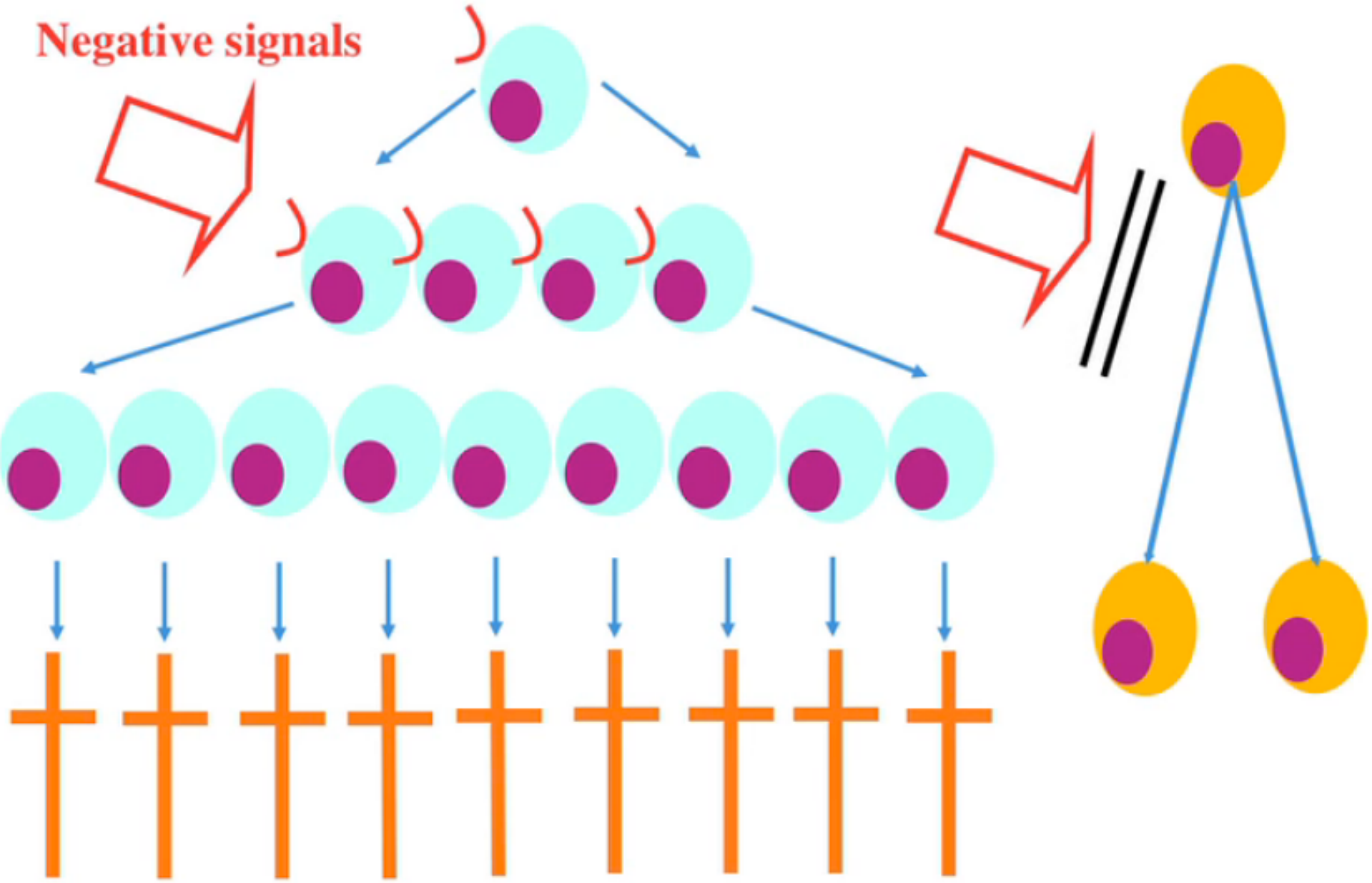
vs.

2-3 daughters from a leukemic cell

Dysregulated growth regulation of cancer cells

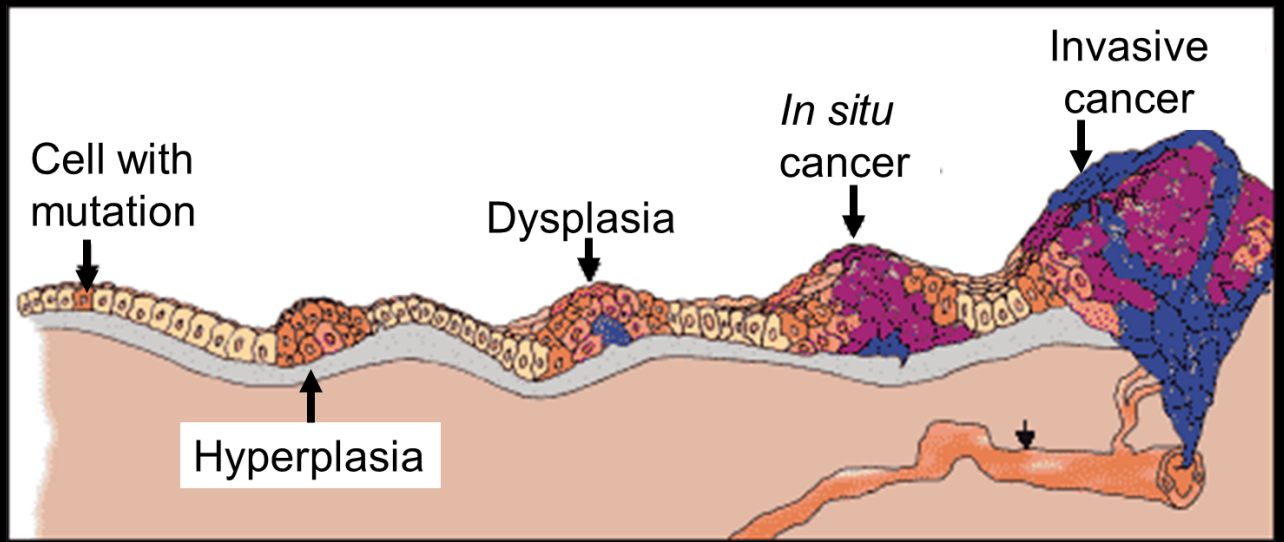


The failure of cancer cells to respond to negative growth signals provides a proliferative advantage



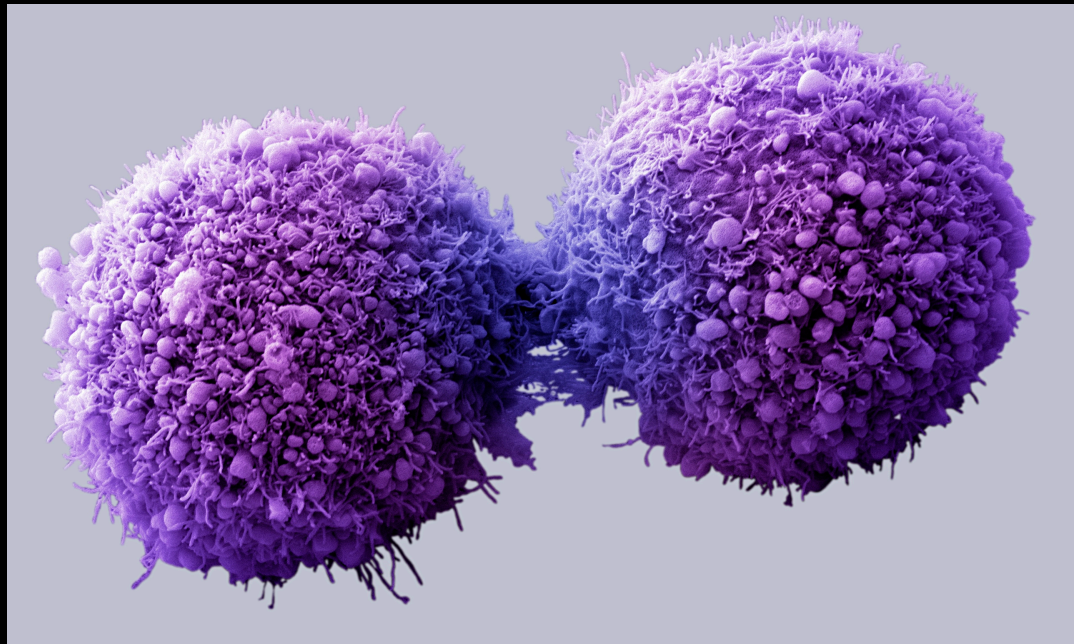
Malignant

- Cancerous tumors are malignant
- Malignant = can spread into or invade nearby tissues
- Metastatic = cancer cells which have broken off and traveled to distant places in the body

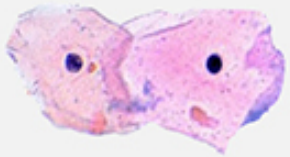
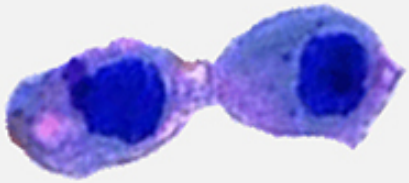
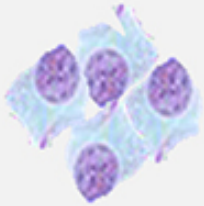
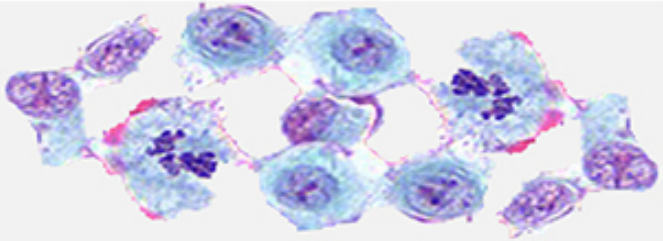
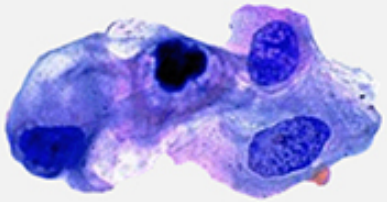
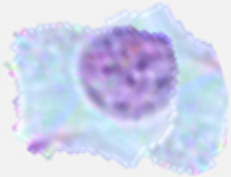
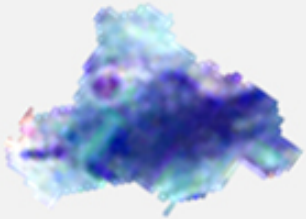


Cancer Cells Less Specialized

- Cancer cells are less specialized
- Normal cells are distinct and have specific functions
- Cancer cells are/do not

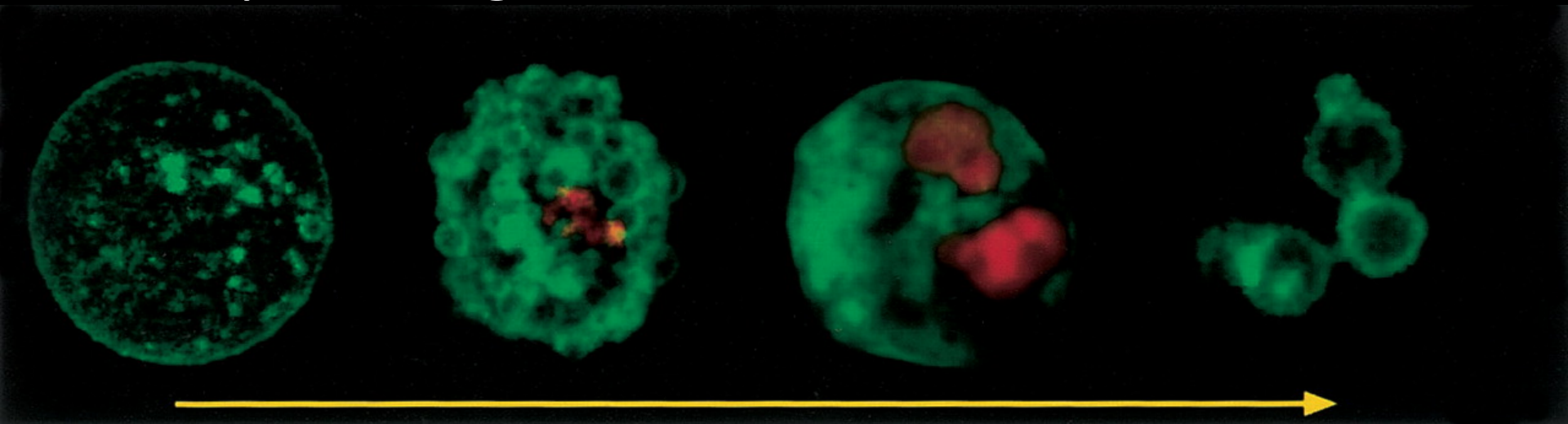


Normal and Cancer Cells under the microscope

Normal	Cancer	
		Large, variably shaped nuclei
		Many dividing cells; Disorganized arrangement
		Variation in size and shape
		Loss of normal features

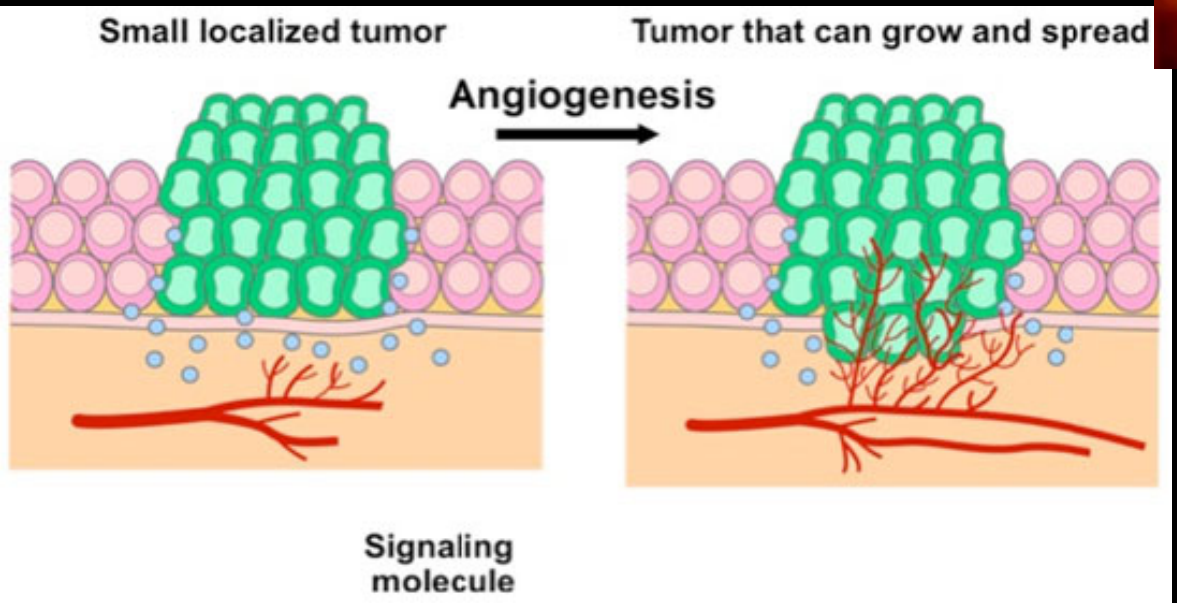
Run Red Lights

- Cancer cells ignore signals that tell cells to stop dividing or to die.



The Power of Influence

- Cancer cells can influence normal cells to support / feed the cancer.

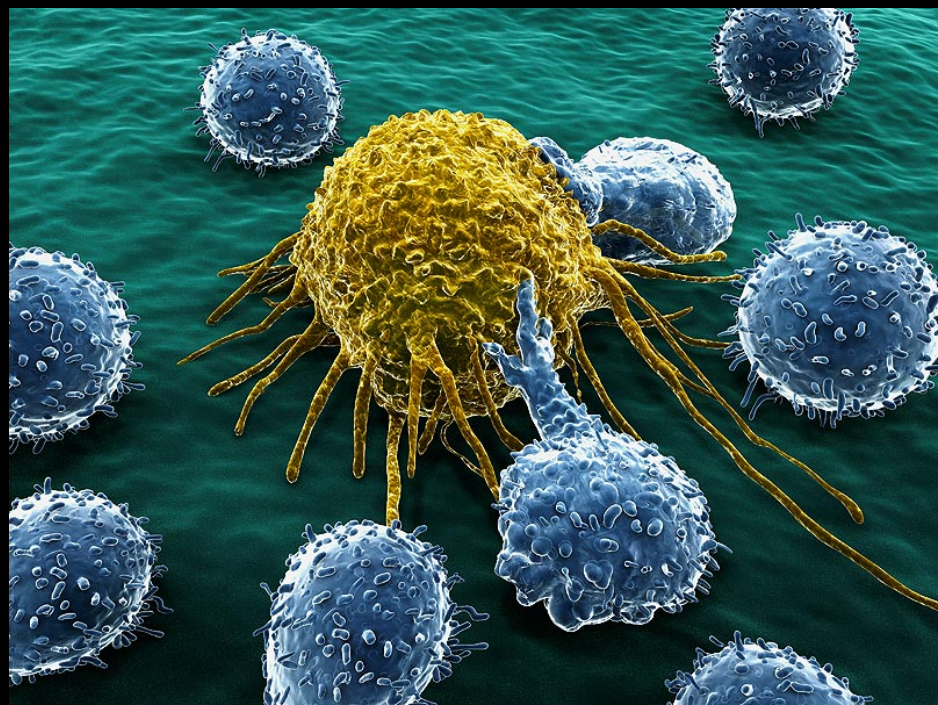


Hiding

- Cancer cells can “hide” from the immune system

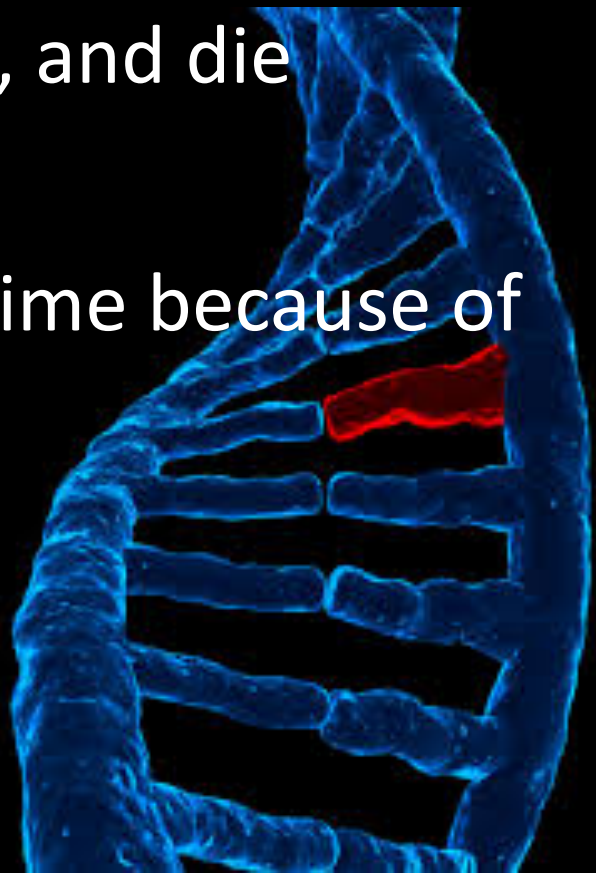
Using The Immune System

- Tumors can use the immune system to stay alive and grow
- Cancer cells can keep the immune cells from killing the cancer cells

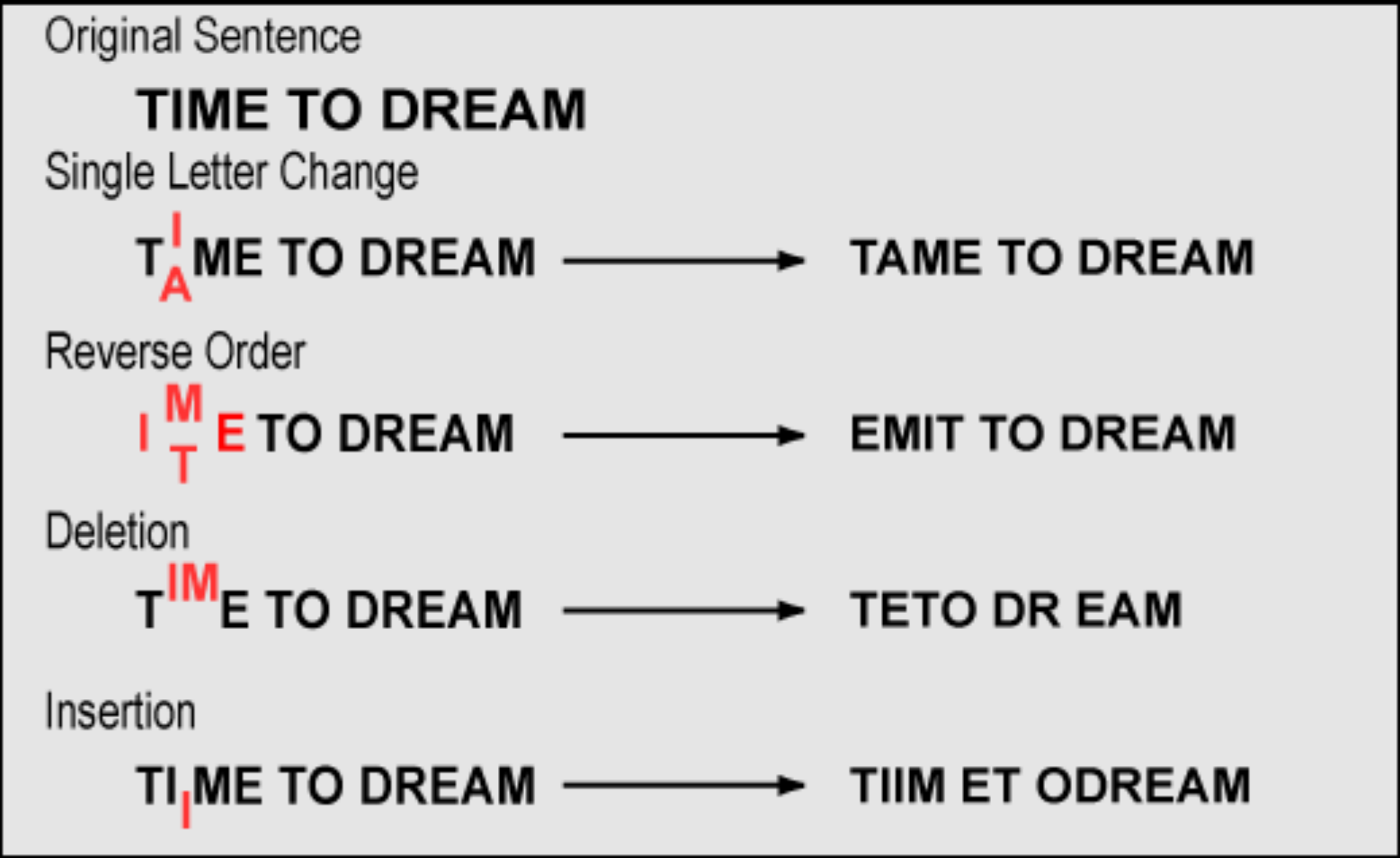


Cancer and Genes

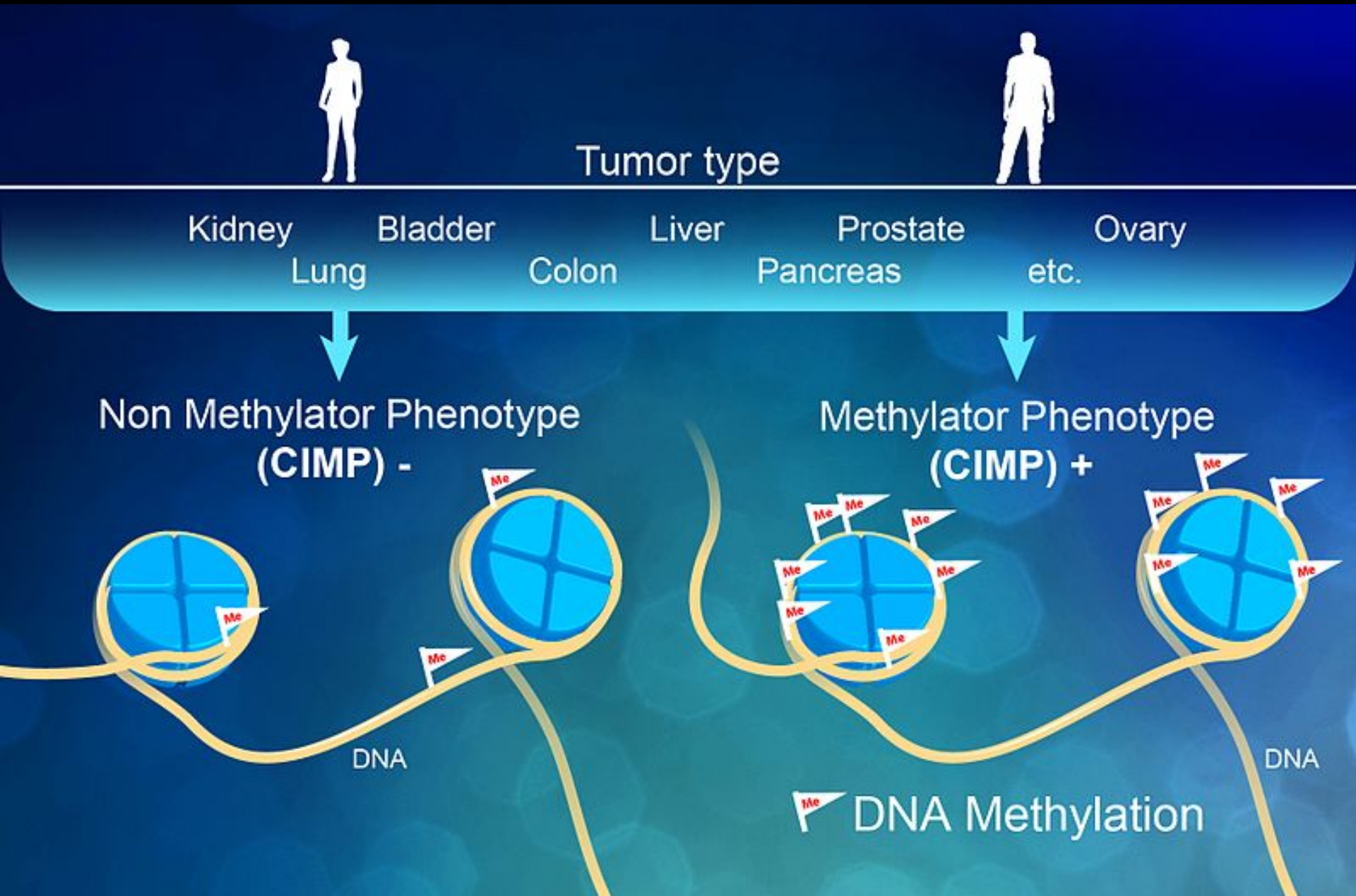
- Cancer is a genetic disease
- It is a result of changes in genes which control how cells function, grow, divide, and die
- It can be inherited
- It can develop in a person's lifetime because of damage to DNA
  - Substances
  - Radiation



Genetic Mutations



Epigenetics & Cancer



Your Unique Mutations

- Each cancer has unique combination of genetic changes
- Additional changes occur with growth
- Different cells within a tumor may have different genetic changes
- Cancer cells generally have more mutations than normal cells

Genetic Changes

- Proto-Oncogenes
  - Involved in normal cell growth & division
  - Altered → Oncogenes
- Tumor Suppressor Genes
  - Involved in controlling cell growth & division
  - Altered → cells divide uncontrollably
- DNA Repair Genes
  - Fix damaged DNA
  - Altered → cells develop additional mutations

Lifetime Cancer Risk: USA

Gender	% Risk Developing	% Risk Dying

Lifetime Cancer Risk: USA

Gender	% Risk Developing	% Risk Dying
Males	43.31 [1 in 2]	22.83 [1 in 4]

Lifetime Cancer Risk: USA

Gender	% Risk Developing	% Risk Dying
Males	43.31 [1 in 2]	22.83 [1 in 4]
Females	37.81 [1 in 3]	19.26 [1 in 5]

Cancer Risk by Age

Age Decade Developing Cancer	Risk of Developing Cancer
50-59	1 : 20
60-69	1 : 10
70-79	1 : 5
80-89	1 : 3

A Growing Problem

- 2002 → 2 states with CA deaths > CVD deaths
- 2014 → 22 states with CA deaths > CVD deaths

An Ageing Problem

Percentage of Elderly (≥65) in Total Population

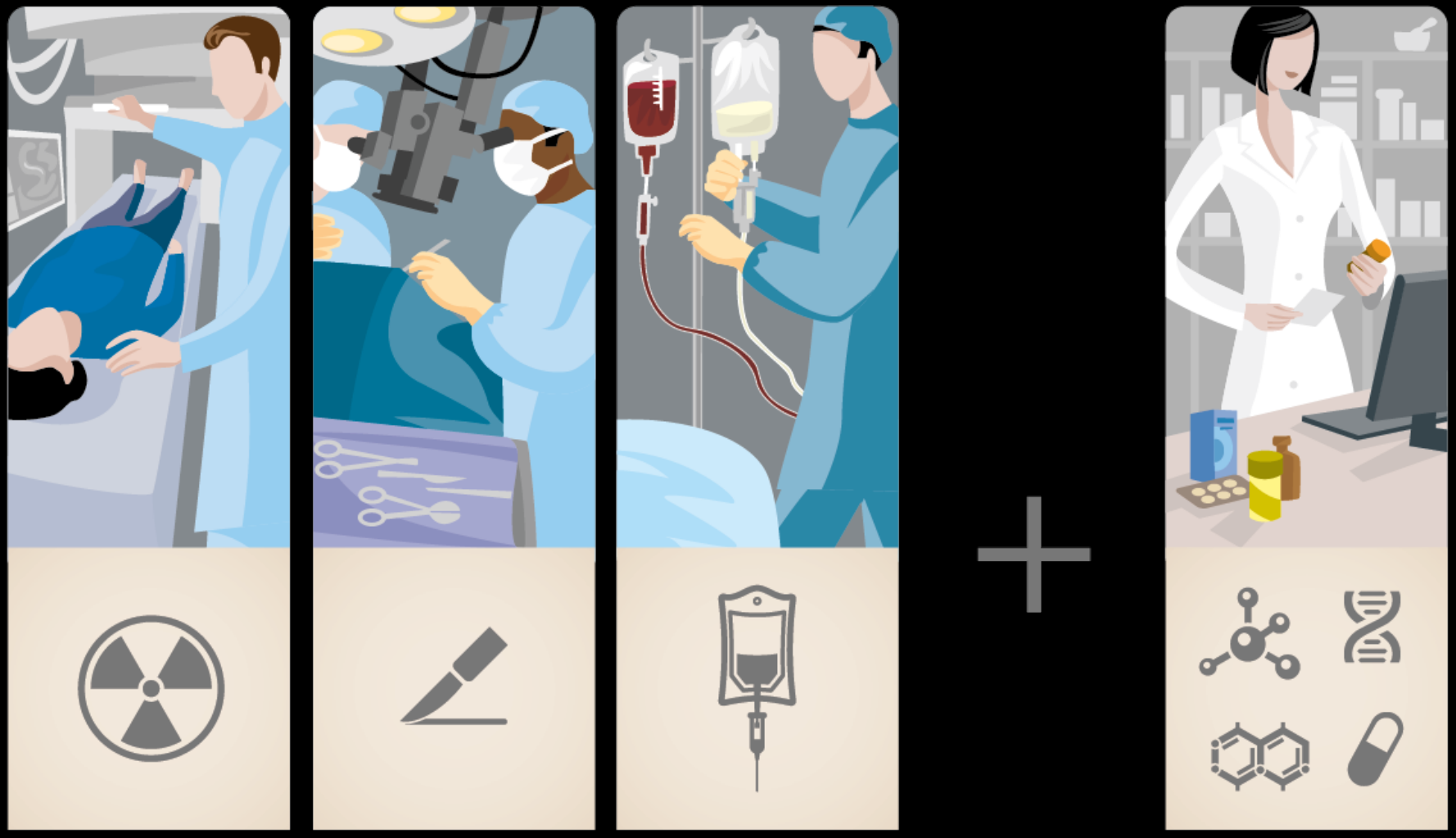
Country	1960	1970	1980	1990	2000	2020
Europe	10.6	12.2	13.8	14.7	16.3	21.0
US	9.2	9.8	11.2	12.2	12.3	15.9
World	5.3	5.5	5.9	6.2	6.9	9.4

Cancer Risk Factors

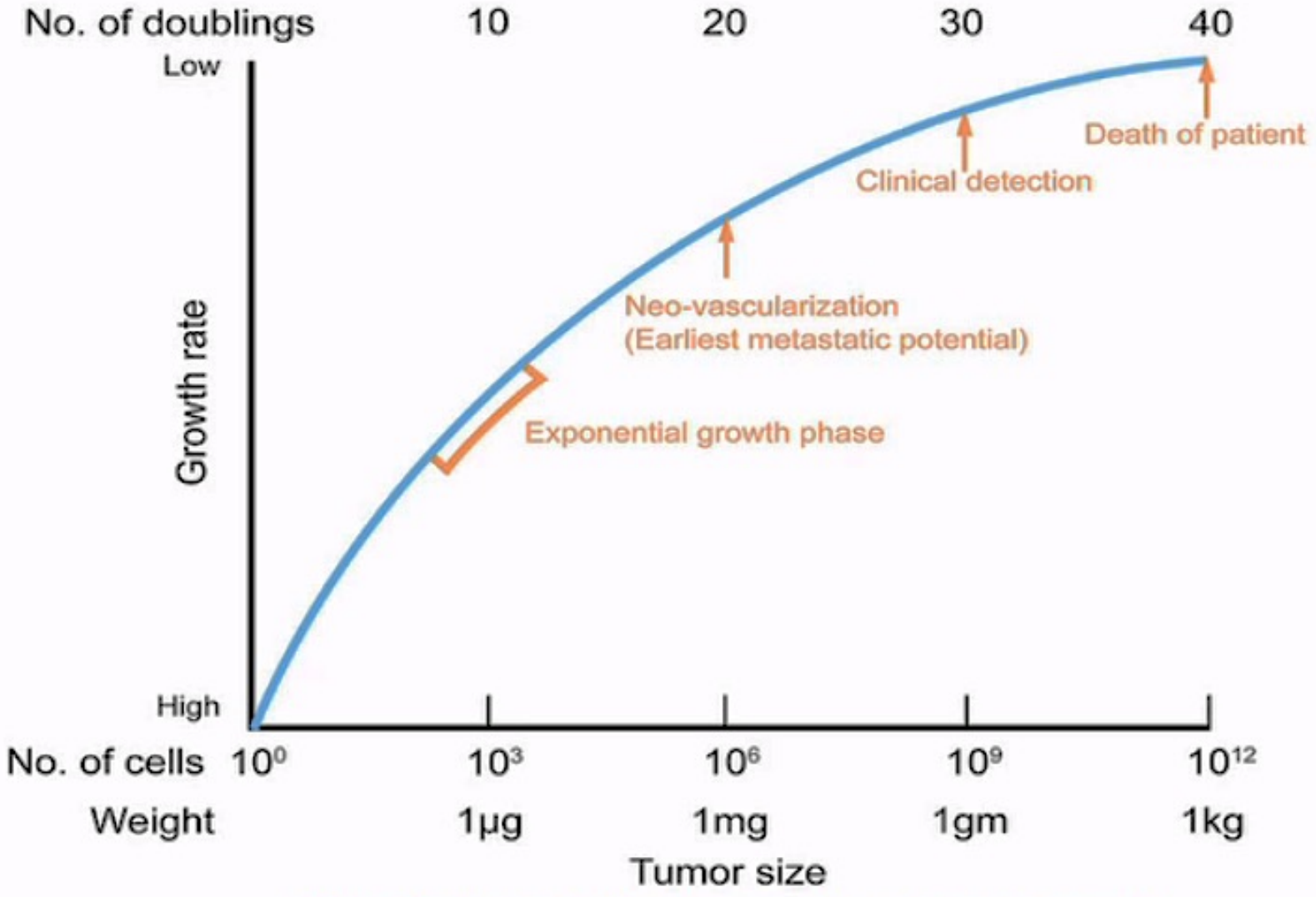
- Age
- Alcohol
- Cancer-Causing Substances
- Chronic Inflammation
- Diet
- Hormones
- Immunosuppression
- Infectious Agents
- Obesity
- Radiation
- Sunlight
- Tobacco

Risk Factors for Cancer. National Cancer Institute. December 23, 2015. https://www.cancer.gov/about-cancer/causes-prevention/risk Accessed March 16, 2017.

Cancer Treatment - Conventional

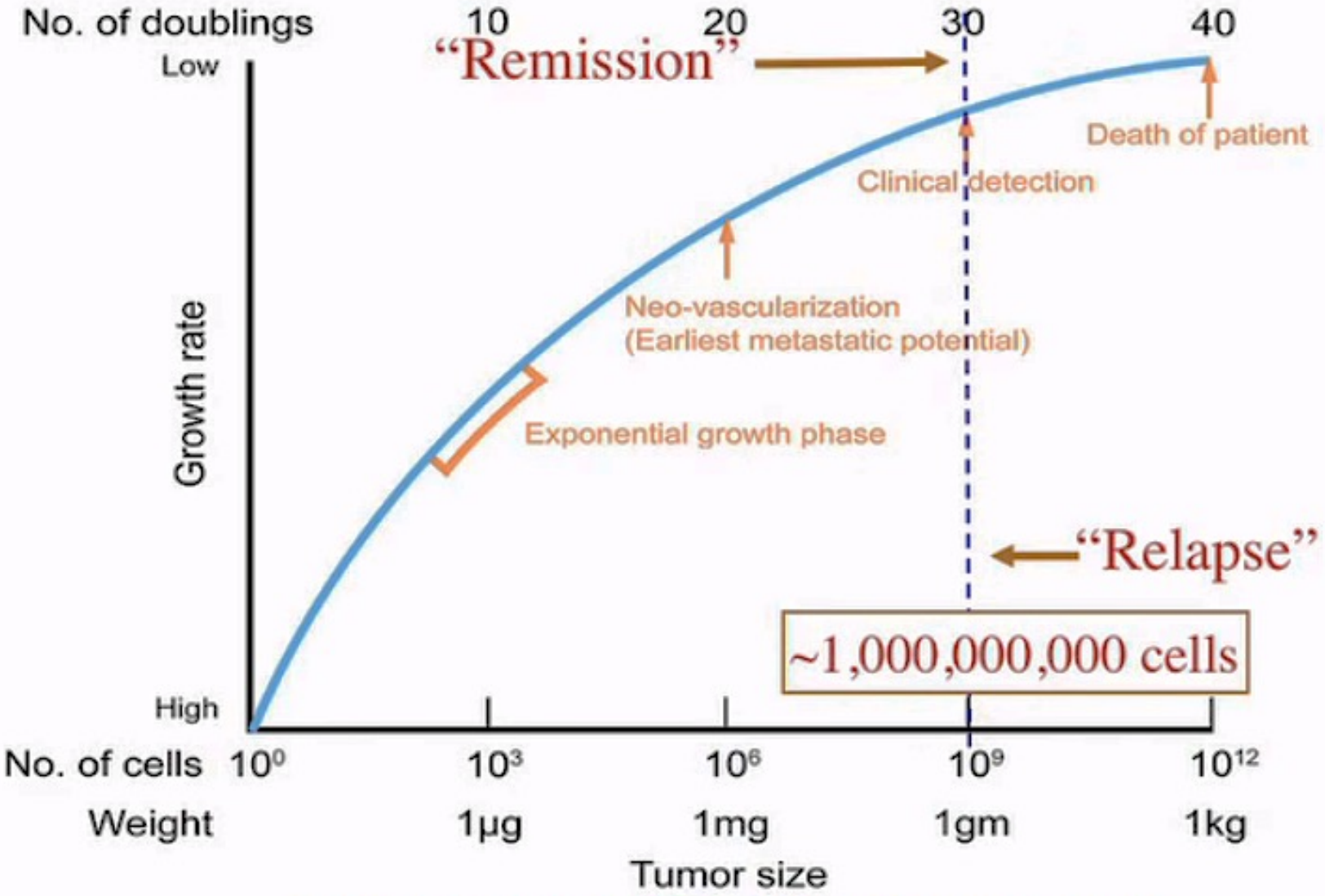


Biological and clinical correlates of tumor growth



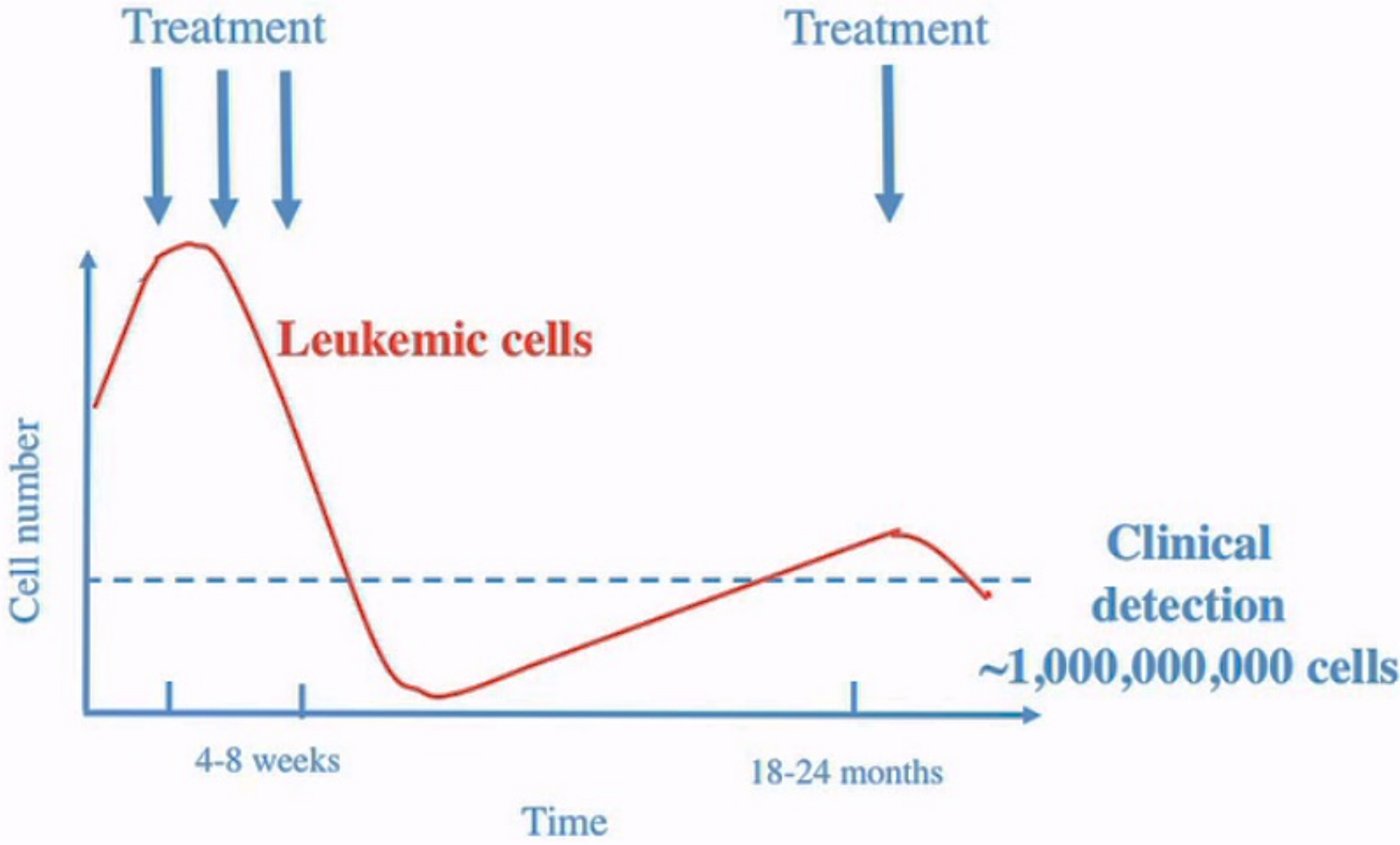
Biological and clinical correlates of tumor growth

Biological and clinical correlates: "remission" and "relapse"

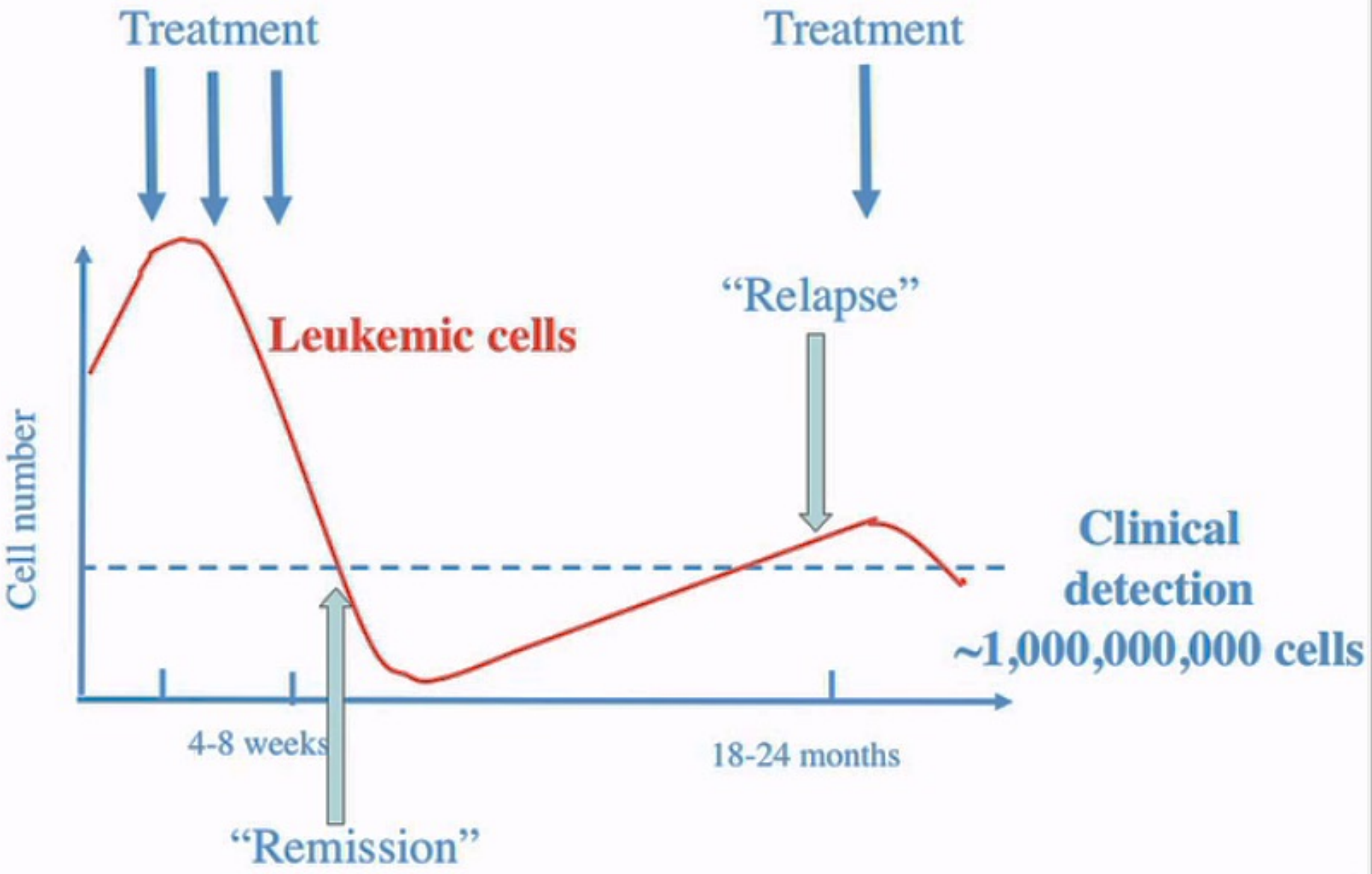


Biological and clinical correlates of tumor growth

Clinical behavior of leukemia



Clinical behavior of leukemia



Cancer Treatment – Nutrition

- Fruits & Vegetables protect against several cancers
  - Mouth, throat, voice box, esophagus, stomach, lung, pancreas, prostate, etc.
- Plant phytochemicals
  - Regulate hormones
  - Slow cancer growth
  - Reduce inflammation
  - Reduce oxidative damage

Food And Cancer Prevention. Cancer.net. http://www.cancer.net/navigating-cancer-care/prevention-and-healthy-living/food-and-cancer-prevention Accessed March 16, 2017.

Cancer Treatment – Nutrition

- Cruciferous vegetables
  - Broccoli, cauliflower, cabbage, Brussels sprouts, bok choy, kale
  - Mouth, pharynx, voice box, esophagus, stomach
  - Help regulate body enzymes the defend against cancer
  - Can stop some cancer cell growth

Food And Cancer Prevention. Cancer.net. http://www.cancer.net/navigating-cancer-care/prevention-and-healthy-living/food-and-cancer-prevention Accessed March 16, 2017.

Cancer Treatment – Nutrition

- Lycopene
  - Tomatoes, pink grapefruit, watermelon, apricots
  - Lung, stomach, prostate, colon, mouth, esophagus

Food And Cancer Prevention. Cancer.net. http://www.cancer.net/navigating-cancer-care/prevention-and-healthy-living/food-and-cancer-prevention Accessed March 16, 2017.

Cancer Treatment – Nutrition

- Soy
  - Breast, ovary,

Food And Cancer Prevention. Cancer.net. http://www.cancer.net/navigating-cancer-care/prevention-and-healthy-living/food-and-cancer-prevention Accessed March 16, 2017.

Cancer Treatment – Nutrition

- Allium vegetables
  - Garlic, onion, leeks, chives, scallions, etc.
  - Allylsulfides, flavonoids, quercitin
  - Inhibit mutagenesis
  - Modulate enzyme activities
  - Inhibit DNA adduct formation
  - Scavenge free radicals
  - Affect cell proliferation and growth

Sengupta A, Ghosh S, Bhattacharjee S. Allium vegetables in cancer prevention: an overview. Asian Pac J Cancer Prev. 2004 Jul-Sep;5(3):237-45.

Highly Refined Foods

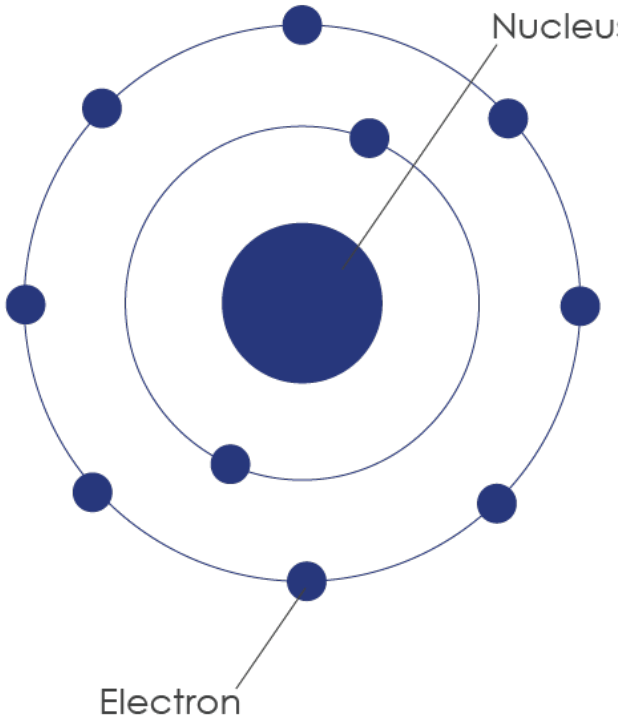
Meat (including fish)

Eggs & Dairy

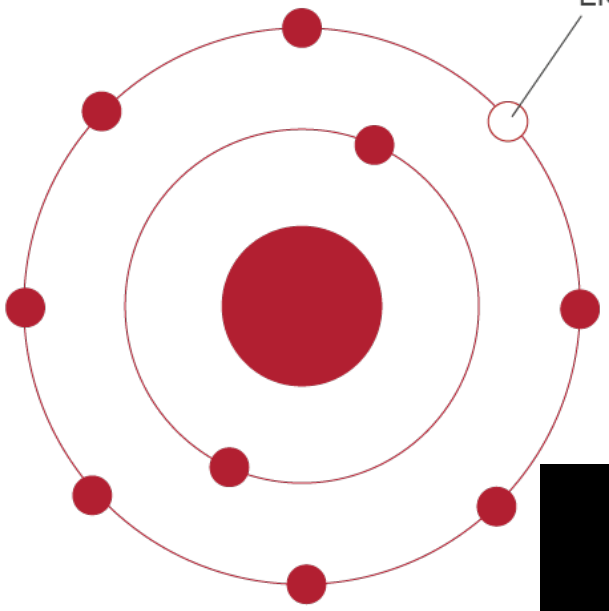
Fried Foods

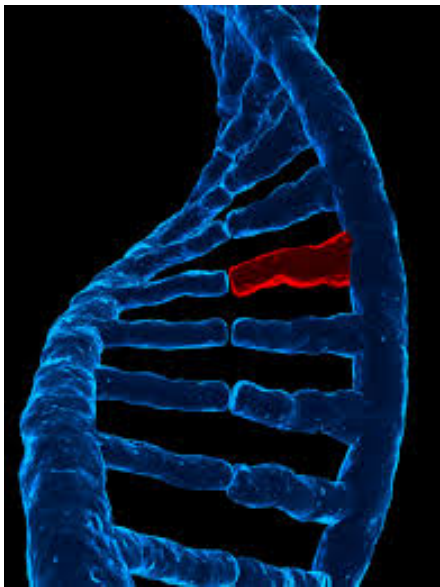
What do all of these have in common?

Stable Molecule



Free Radical





Cancer Treatment – Nutrition

- Eat whole plant foods
- 80% raw
- Variety of colors
- Avoid animal foods, dairy/eggs, processed carbohydrates, sugars, high fat foods

Cancer Treatment – Exercise

- Increased physical activity has been shown to decrease the risk of developing cancer
  - Colon (40-50%)[1]
  - Breast (30-40%)[1]
  - Uterus[1]
  - Lung[1]
  - Pancreas[2] (55%)
  - Prostate[3] (67-74%)

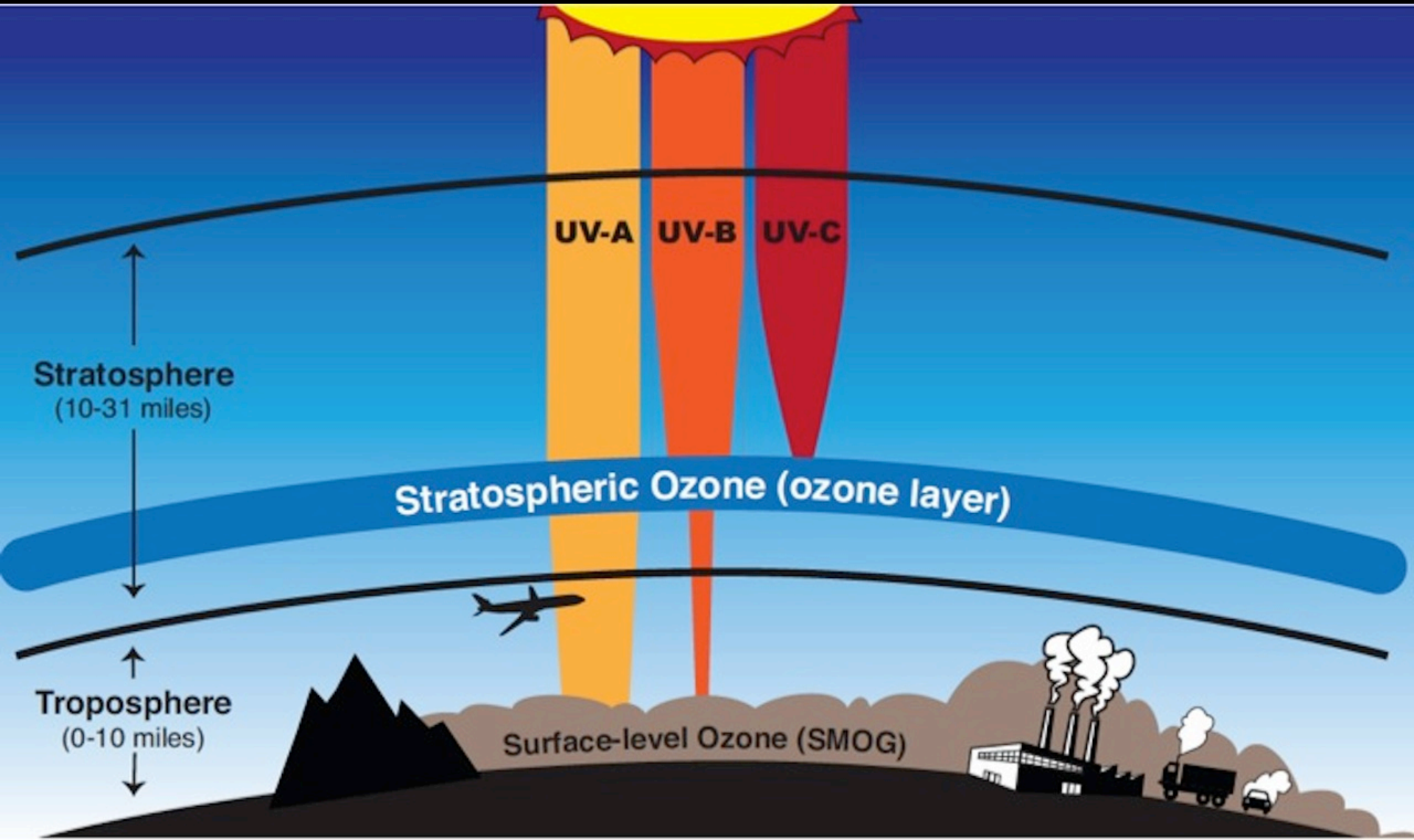
1. Physical Activity and Cancer Risk. Cancer.Net. January, 2016. http://www.cancer.net/navigating-cancer-care/prevention-and-healthy-living/physical-activity-and-cancer-risk Accessed March 16, 2017.
2. Michaud DS, et. al. Physical activity, obesity, height, and the risk of pancreatic cancer. JAMA. 2001 Aug 22-29;286(8):921-9.
3. Giovannucci EL, Liu Y, Leitzmann MF, Stampfer MJ, Willett WC. A prospective study of physical activity and incident and fatal prostate cancer. Arch Intern Med. 2005 May 9;165(9):1005-10.

Cancer Treatment – Exercise

- Increased physical activity has been shown to increase survival of those with cancer
  - Breast (26-40%)

Warburton D, Nicol C, & Bredin S. Health benefits of physical activity: the evidence. CMAJ. 2006;174(6): 801-809.

Cancer Treatment – Sunshine



Cancer Treatment – Tobacco

- 30% of all cancer deaths in the U.S.
- 80% of all lung cancer deaths
- Mouth, larynx, pharynx, esophagus, kidney, cervix, liver, bladder, pancreas, stomach, colon, rectum,
- Leukemia

The American Cancer Society medical and editorial content team. Health Risks of Smoking Tobacco. The American Cancer Society. November 12, 2015. https://www.cancer.org/cancer/cancer-causes/tobacco-and-cancer/health-risks-of-smoking-tobacco.html Accessed March 16,

Cancer Treatment – Alcohol

- All types of alcohol
- Ethanol, acetaldehyde, estrogen
  - Head, neck, liver, esophagus, breast, colon, rectum, stomach

Cancer Treatment – Toxins

- Acetaldehyde
- Aflatoxins
- Asbestos
- Azathiaprine
- Benzene
- Cadmium
- Coal
- Diesel exhaust
- Formaldehyde
- HIV
- HPV
- HTLV-1
- HHV-8
- Outdoor air pollution
- Radon
- Silica dust
- Trichloroethylene
- Vinyl chloride

The American Cancer Society medical and editorial content team. Known and Probable Human Carcinogens. The American Cancer Society. November 3, 2016. https://www.cancer.org/cancer/cancer-causes/general-info/known-and-probable-human-carcinogens.html Accessed March 16, 2017.

Cancer Treatment – Herbs

- Sweet Wormwood

Cancer Treatment – Herbs

- Turmeric

Cancer Treatment – Herbs

- Red Clover

RED CLOVER
Trifolium pratense L.
PEA FAMILY

Cancer Treatment – Herbs

- Black Cumin

Cancer Treatment – Herbs

- Aloe

Cancer Treatment – Herbs

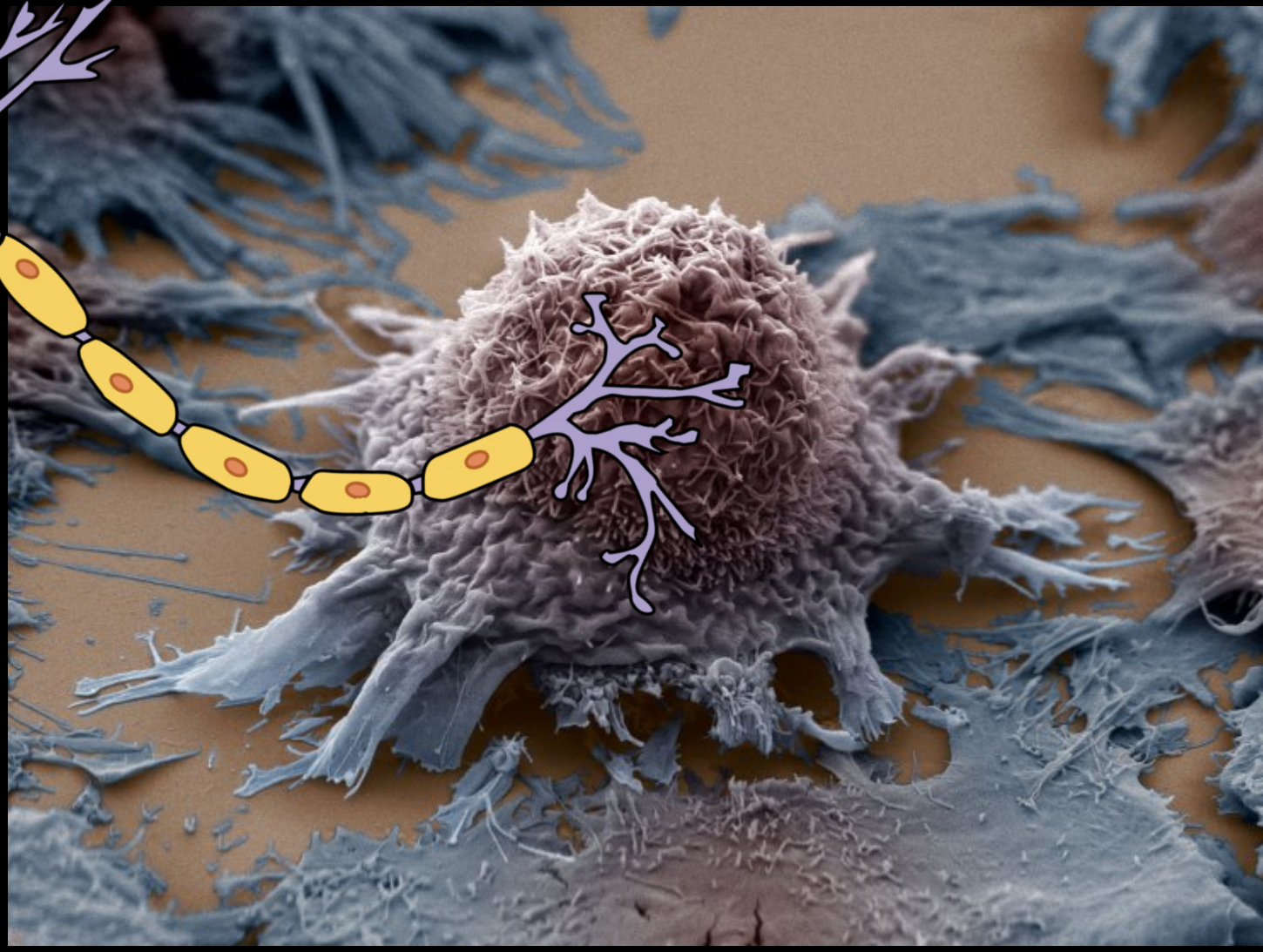
- Shitake / Maitake

Cancer Treatments – Hydrotherapy

- Hyperthermia (Fever) Baths

1. Burd R, et. al. Tumor cell apoptosis, lymphocyte recruitment and tumor vascular changes are induced by low temperature, long duration (fever-like) whole body hyperthermia. J Cell Physiol. 1998 Oct;177(1):137-47.
2. Sakaguchi Y, et. al. Apoptosis in tumors and normal tissues induced by whole body hyperthermia in rats. Cancer Res. 1995 Nov 15;55(22):5459-64.
3. Robins HI, et. al. Cytokine induction by 41.8 degrees C whole body hyperthermia. Cancer Lett. 1995 Nov 6;97(2):195-201.
4. Pettigrew, RT, Galt, JM, Ludgate, CM, Smith, AN. Clinical Effects of Whole Body Hyperthermia In Advanced Malignancy. BMJ. 1974 Dec: 679-682.
5. Atanackovic, D, et. al. 41.8C Whole Body Hyperthermia As An Adjunct To Chemotherapy Induces Prolonged T-Cell Activation In Patients With Various Malignant Diseases. Cancer Immunol Immunother. 2002 Oct 18;51:603-613.

Nerves & Cancer



Sha L, Yanlai S, and Dongwei G. Role of the nervous system in cancer metastasis. Oncol Lett. 2013 Apr; 5(4): 1101–1111.

Who/What Am I?

- I will not submit to anyone else's instructions – I am rebellious
- I will not cooperate and work together as a team – I am independent
- I will not respect someone else's space – I am inconsiderate
- I will strip others of their resources – I am competitive

Who/What Am I?

- I will start small, hide while I grow, and not manifest my true character until late in the game – I am subtle
- I will spread to other areas and take over – I am aggressive
- I will remove your loved ones from you – I am malicious

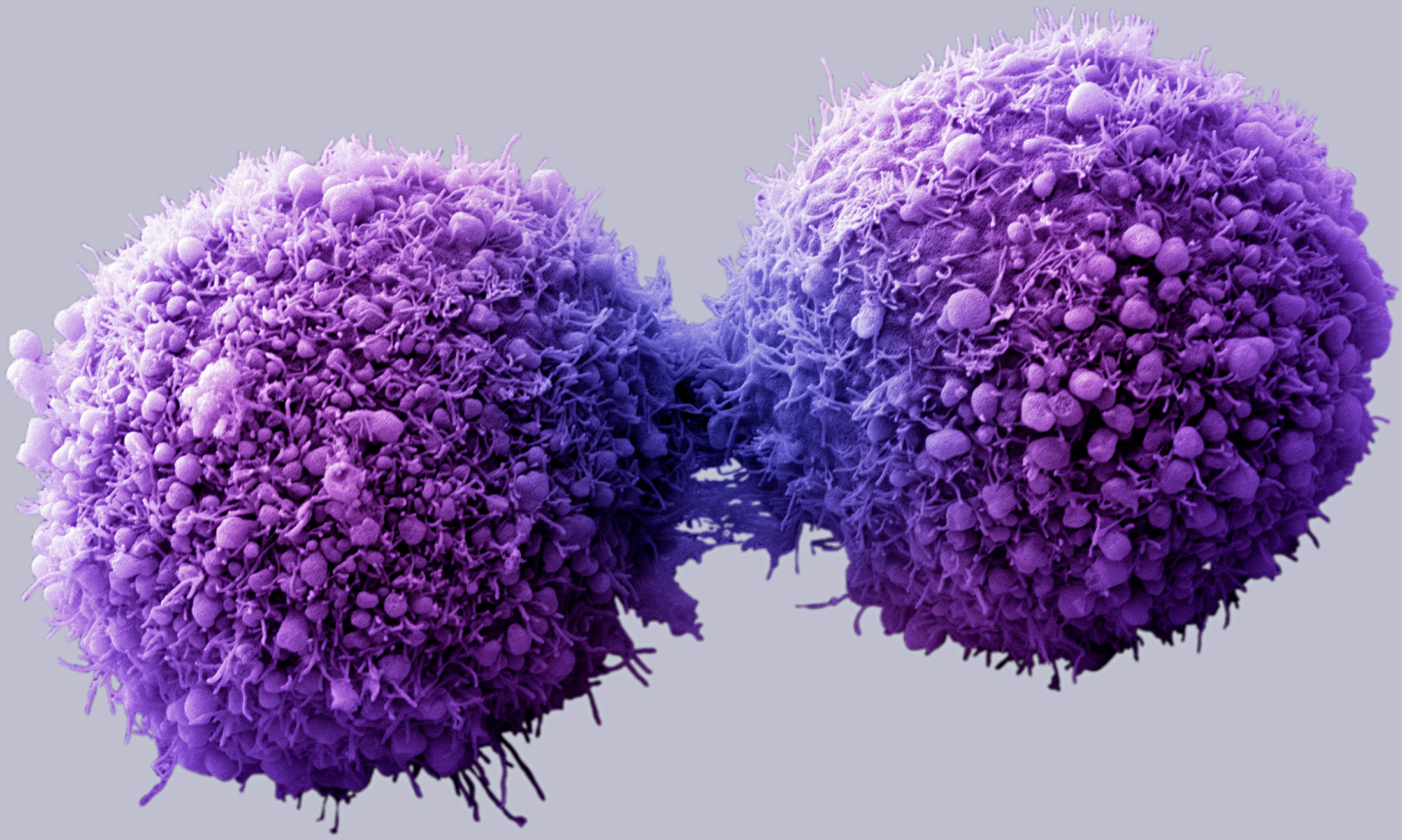
Who/What Am I?

- I will use more and more of your resources until you die – I am selfish
- I am seeking to be immortal by my own rules, but in the end I will die.
- I think that I am God, and I demand everything for myself.
- I make others sick and weak, cause them pain, and finally kill them.

Who/What Am I?

I am Sin

Cancer



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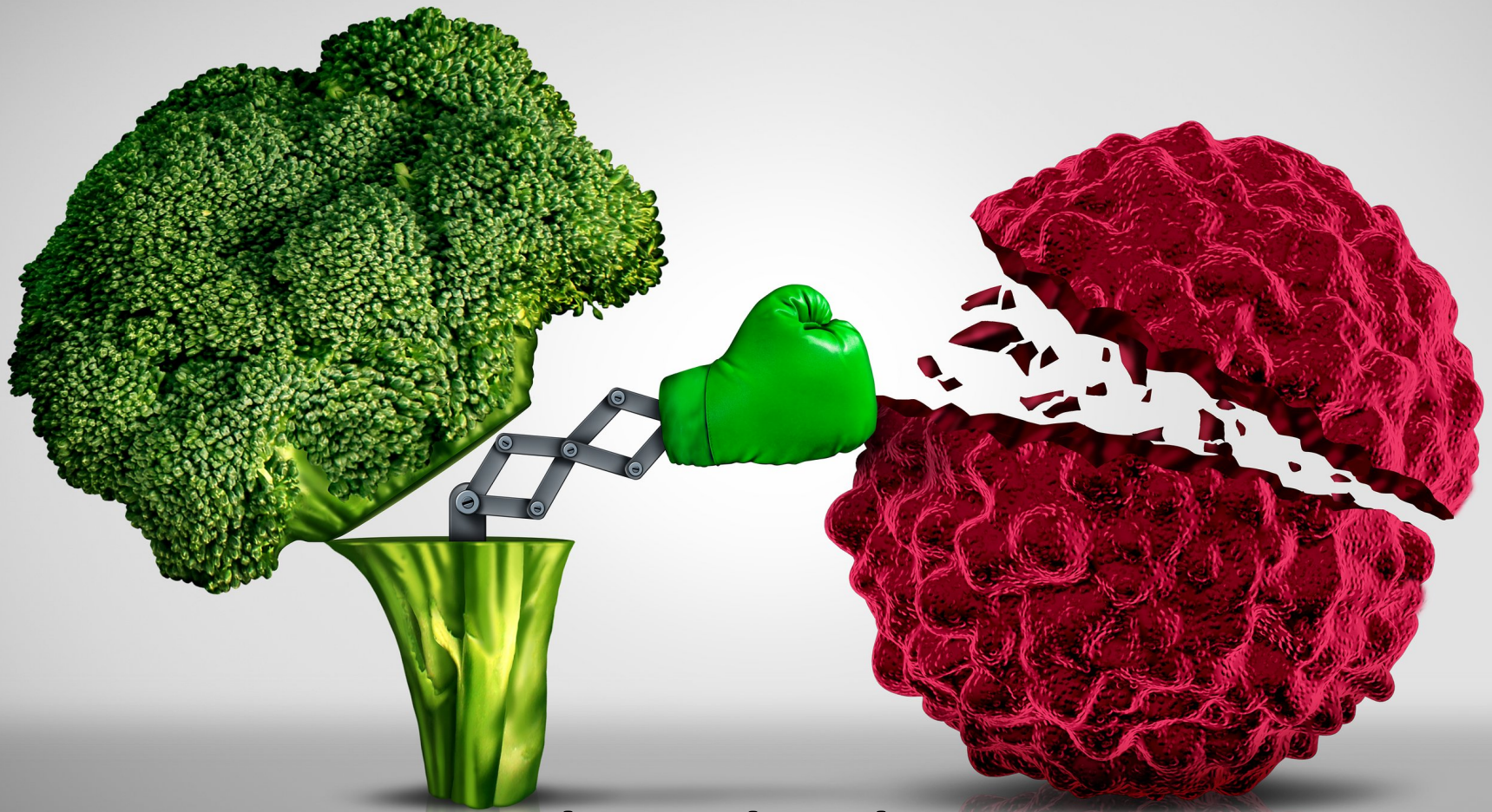

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